

other properties can be laminated or otherwise adhered to substrate **110** or filler material **140** with or without other structural or otherwise functional layers disposed between.

[0024] Touch screen construction **100** preferably transmits visible light so that a display, graphics, or other information or indicia can be viewed through the touch screen. As such, each of the components identified in **FIG. 1** is preferably transmissive of visible light.

[0025] Substrate **110** can be any suitable material including glass or plastic. Exemplary plastics include PET, polycarbonates, polyacrylates, substantially transparent polyimides, substantially transparent polyurethanes, and the like. Substrate **110** can be rigid or flexible. Substrate **110** can optionally include additional coatings, for example on surface **112**, such as hardcoats, antireflective coatings, polarizers, retarders, wave plates, diffusers, antiglare coatings, light control films, and the like.

[0026] Coating **120** can be any suitable material that is desirably transmissive of visible light when coated to a desired thickness and suitably processed. Coating **120** has an index of refraction that is less than the index of refraction of the substrate **110** and less than the index of refraction of the transparent conductive material **130**. For example, when PET is used as substrate **110** and ITO is used as the transparent conductor **130**, an exemplary material for coating **120** is silicon oxide such as SiO_2 . Coating **120** substantially covers substrate **110**, and can be provided in any suitable manner such as sputter deposition, chemical vapor deposition, and the like. Without wishing to be bound by any theory, coating **120** preferably has a thickness selected to reduce reflections of visible light transmitted through the touch screen **100** in areas covered by the transparent conductor pattern **130**.

[0027] Transparent conductor pattern **130** can include any suitable transparent conductive material such as transparent conductive oxides or transparent conductive polymers. Examples of transparent conductive oxides include indium tin oxide (ITO), tin antimony oxide (TAO), tin oxide (TO), and the like. Examples of conductive polymers include polypyrrole, polyaniline, polyacetylene, polythiophene, polyphenylene vinylene, polyphenylene sulfide, poly p-phenylene, polyheterocycle vinylene, and materials disclosed in European Patent Publication EP-1-172-831-A2, which is incorporated by reference herein in its entirety. The transparent conductor pattern **130** can be patterned by any suitable means such as deposition of the transparent conductive material through a mask, forming a film of the transparent conductive material and then removing portions of the material by etching or any other suitable removal technique, and the like. Upon patterning the transparent conductive material, portions of the coating **120** are covered by the pattern **130** and other portions of the coating **120** are left uncovered by the pattern **130**.

[0028] In exemplary constructions, substrate **110** is a film of PET (index of refraction about 1.67), coating **120** is a coating of silicon oxide such as SiO_2 (index of refraction about 1.45) having a thickness in a range of about 15 to 70 nm, preferably 25 nm, and transparent conductor **130** is ITO (index of refraction about 2.0) having a thickness of about 20 to 35 nm.

[0029] Filler material **140** can be any suitable material that can be coated or otherwise disposed over transparent conductor pattern **130** so that it covers the pattern **130** and substantially fills in the gaps between portions of pattern **130**, making contact with coating **120** in areas uncovered by the pattern **130**. Filler material **140** can be the same material as used for coating **120**. In some embodiments, filler material **140** can be an adhesive material such as an optically clear adhesive, for example an optical grade acrylic pressure sensitive adhesive. Filler material **140** preferably has an index of refraction of about 1.4 to 1.8 in constructions where the substrate **110** is PET, the coating **120** is silicon oxide, and the transparent conductor **130** is ITO. For example, in such constructions suitable filler materials can include an acrylic pressure sensitive adhesive or a silicon oxide.

[0030] Construction **100** can be configured for adhering to an object such as the front of a display screen, another substrate (such as glass or another rigid or flexible plate), or another suitable object. This can be done by disposing an adhesive on surface **112** of substrate **110**, on surface **142** of filler material **140**, on another layer or layers disposed on surface **112** or surface **142**, or by using an adhesive as the filler material **140** and bonding directly to the adhesive filler. In such circumstances, a release liner may be provided over the adhesive layer for convenient storage and handling before removing the release liner and suitably adhering the construction to a desired surface.

[0031] **FIG. 2** shows a touch screen construction **200** like that shown in **FIG. 1** and additionally including a second substrate. Touch screen construction **200** includes a first substrate **210**, a coating **220** covering the first substrate **210**, a transparent conductor pattern **230** disposed on coating **220**, a filler material **240** covering transparent conductor pattern **230** and contacting coating **220** in areas uncovered by the pattern **230**, and a second substrate **250** disposed over the filler material **240**. Substrate **250** can be bonded to the construction **200** through the use of an adhesive disposed between the filler material **240** and the substrate **250**. Alternatively, filler material **240** can itself be an adhesive material that can be used to adhere substrate **250** to the construction **200**. In embodiments where filler layer **240** is an adhesive, any suitable adhesive can be used that is capable of being disposed over transparent conductor pattern **230** and coating **220** so that the adhesive contacts the transparent conductor pattern **230** and the uncovered portions of the coating **220**. Exemplary adhesives include pressure sensitive adhesives and/or acrylic adhesives, and are preferably optically clear. Substrate **250** can be any suitable material include glass and plastic, and can be rigid or flexible.

[0032] The transparent conductor patterns **130** of construction **100** and **230** of construction **200** can form the sensing elements for touch screens. When a conductive touch object such as a user's finger comes into close enough proximity, the conductive touch object can be capacitively coupled to one or more of the sensing elements that make up the transparent conductor pattern. In many cases, the transparent conductor pattern includes a series of independently addressable transparent conductive lines, stripes, pads, traces, or the like. Controller electronics drive each of these so that capacitive coupling with a touch object results in a detectable signal. From the strength of the signals, it can be determined which portion or portions of the transparent conductor pattern are being capacitively coupled, thereby identifying the position of the touch.